Remarks

The Applicants thanks the Examiner for examining the claims of the present application. By this Amendment, the Applicants are amending claims 1, 13-17, and 21. With entry of this Amendment, claims 1-23 will be pending. The Examiner's rejections are respectfully traversed and discussed in turn below.

The Examiner's § 101 Rejections of Claims 13-17 Have Been Addressed

The Examiner rejects claims 13-17 under 35 U.S.C. § 101 and alleges that the claimed simulator is computer software *per se*. Although the Applicants disagree, claim 13 has been amended to recite "a computer configured to implement: an elaboration engine . . . and a simulation kernel."

Accordingly, the Examiner's § 101 rejections should be withdrawn, and such action is respectfully requested.

The Examiner's § 103 Rejection of Amended Independent Claim 1 Should Be Withdrawn

The Examiner rejects claim 1 as being obvious under 35 U.S.C. § 103 over U.S. Patent No. 6,424,959 ("*Bennett*") in view of U.S. Patent No. 5,961,181 ("*Sanadidi*"). The Examiner's rejection is respectfully traversed.

Amended independent claim 1 recites a method of simulating a circuit using an analog or RF simulator, comprising:

> defining two circuit descriptions of the circuit to be used during the simulation, a first circuit description used for accuracy of the simulation and a second circuit description, different from the first circuit description, used for increasing the speed of the simulation; and
> simulating the circuit using both the first and second circuit descriptions, the simulating comprising using both the first and second circuit descriptions during a single simulation time step.

The Examiner admits that *Bennett* does not disclose "simulating the circuit using both the first and second circuit descriptions". It follows that *Bennett* also does not disclose that the "simulating compris[es] using both the first and second circuit descriptions during a single simulation time step".

Sanadidi does not cure *Bennett* of its deficiencies. As explained in the cited portions of *Sanadidi*: 'It is beneficial then, for a user to be able to choose *either a detailed subsystem model*

or a simplified version. . . . The implementation *should allow switching from simplified to the detailed version* at an appropriate point in a run." (*Sanadidi*, col. 11, lines 18-24) (emphasis added). Thus, in *Sanadidi*, *either* a detailed subsystem model is operating *or* a simplified version. This "either/or" approach of *Sanadidi* in no way teaches or suggests "simulating [that] compris[es] using both the first and second circuit descriptions during a single simulation time step" as in amended independent claim 1.

Further, the statements in *Sanadidi* that "*[i]t is beneficial* then, for a user to be able to choose *either* a detailed subsystem model *or* a simplified version" and that "[t]he implementation *should allow switching* from simplified to the detailed version at an appropriate point in a run" actually teach away from any combination of references with *Sanadidi* in which the simplified version and the detailed version are used during a single simulation time step. *See* MPEP 2145.X.D.2 ("References Cannot Be Combined Where Reference Teaches Away from Their Combination").

Accordingly, because neither *Bennett* nor *Sanadidi* (alone or in combination with one another) teaches or suggests all features of amended claim 1 and because *Sanadidi* actually teaches away from amended claim 1, the Examiner's § 103 rejection should be withdrawn and such action is respectfully requested.

Dependent Claims 2-12 Are Also Patentable Over the Cited References

The Examiner also rejects claim 2-12 under 35 U.S.C. § 103 over various combinations of references. Claims 2-12 depend from amended independent claim 1 and are allowable for at least the same reasons recited above with respect to claim 1. Claims 2-12 are also allowable for reciting independently patentable combinations of features.

Accordingly, the Examiner's rejections of claims 2-12 should also be withdrawn and such action is respectfully requested.

The Examiner's § 103 Rejection of Amended Independent Claim 13 Should Be Withdrawn

The Examiner's rejects claim 13 as being obvious under 35 U.S.C. § 103 over *Bennett* in view of *Sanadidi* in further view of U.S. Published Patent Application No. 2004/0083437 ("*Gullapalli*"). The Examiner's rejection is respectfully traversed.

Amended independent claim 13 recites an analog or RF simulator for simulating a circuit, comprising:

> a computer configured to implement:
>
> an elaboration engine that receives one or more lists associated with the circuit, the lists comprising a list of components in the circuit, interconnections between the components, and parasitic information, and that defines a first circuit description used for accuracy of the simulation and a second circuit description used for speed of the simulation, the first circuit description being different from the second circuit description; and
>
> a simulation kernel coupled to the elaboration engine that comprises at least a direct solver or linear iterative solver to simulate the circuit, wherein the simulation kernel solves a system of equations, at least one of the equations including a part formed using the first circuit description and a part formed using the second circuit description.

Bennett does not teach or suggest (nor does the Examiner contend that *Bennett* teaches or suggests) a "simulation kernel [that] solves a system of equations, at least one of the equations including a part formed using the first circuit description and a part formed using the second circuit description."

Sanadidi does not cure *Bennett* of its deficiencies. As explained in the portions of *Sanadidi* cited by the Examiner, *Sanadidi* describes "a first submodel" and "a second submodel". Further: "A performance analysis mechanism 306, having input ports connected to the first 302 and the second 304 submodel, executes a simulation of the particular system component using the first 302 and the second 304 submodel. The performance analysis mechanism 306 includes *a switch 308 for switching between the first 302 and the second 304 submodel* through processor 310 control during the simulation at a predetermined point in the execution of the simulation by the processor 310." (*Sanadidi*, col. 11, lines 18-24) (emphasis added). Thus, in *Sanadidi*, simulation is performed with *either* the "first submodel" *or* the "second submodel", but not both. Thus, *Sanadidi* does not teach a "simulation kernel [that] solves a system of equations, at least one of the equations including a part formed using the first circuit description and a part formed using the second circuit description" as in amended independent claim 13.

Further, the "switch 308" in *Sanadidi* for switching between the first submodel and the second submodel actually leads away from any combination with *Sanadidi* in which an equation that is solved during simulation includes "a part formed using the first circuit description and a part formed using the second circuit description". Accordingly, *Sanadidi* teaches away from any

combination of the references that would result in the subject matter claimed in amended claim 13. *See* MPEP 2145.X.D.2.

Gullapalli also does not cure *Bennett* of its deficiencies. The cited portions of *Gullapalli* only describe an iterative formula for solving a nonlinear system of equations having the form F(x)=b. (*Gullapalli*, paras. 21-22). There is no teaching or suggestion in *Gullapalli* that one of the equations includes "a part formed using [a] first circuit description and a part formed using [a] second circuit description". Therefore, *Gullapalli* also does not teach the recited feature of amended independent claim 13.

Accordingly, because neither *Bennett*, nor *Sanadidi*, nor *Gullapalli* (alone or in combination with one another) teaches or suggests all features of amended claim 13 and because *Sanadidi* actually teaches away from amended independent claim 13, the Examiner's § 103 rejection should be withdrawn and such action is respectfully requested.

Dependent Claims 14-17 Are Also Patentable Over the Cited References

The Examiner also rejects claim 14-17 under 35 U.S.C. § 103 over various combinations of references. Claims 14-17 depend from amended independent claim 13 and are allowable for at least the same reasons recited above with respect to claim 13. Claims 14-17 are also allowable for reciting independently patentable combinations of features.

Accordingly, the Examiner's rejections of claims 14-17 should also be withdrawn and such action is respectfully requested.

The Examiner's § 103 Rejection of Amended Independent Claim 18 Should Be Withdrawn

The Examiner's rejects claim 18 as being obvious under 35 U.S.C. § 103 over *Bennett* in view of *Sanadidi*. The Examiner's rejection is respectfully traversed.

Amended independent claim 18 recites a simulator for simulating a circuit, comprising:

> means for reading a first description of the circuit that comprises a list of components in the circuit, the interconnections between the components, and parasitic information;
> means for generating a second circuit description by removing at least a part of the parasitic information from the first circuit description; and
> means for simulating the circuit using substantially the first circuit description comprising the parasitic information and the second circuit description with reduced parasitic information.

Bennett does not teach or suggest "means for generating a second circuit description by removing at least a part of the parasitic information from the first circuit description means for generating a second circuit description by removing at least a part of the parasitic information from the first circuit description." The Examiner cites column 21, lines 35-52, of Bennett as teaching the identified feature of claim 18. However, the cited portion of Bennett only refers to a "netlist" that is passed to a circuit simulator "in order to determine the circuit's behavior without regard to the physical location of the circuit's components and wires." (Bennett, col. 21, lines 48-52.)

The cited portion of Bennett does not describe how the netlist is generated. Specifically, Bennett does not teach "means for generating a second circuit description by removing at least a part of the parasitic information from the first circuit description." Further, in the next paragraph in Bennett, Bennett refers to a netlist "with the added information about the physical location of the components". (Bennett, col. 21, line 54, to col. 22, line 2) (emphasis added). Thus, by teaching that the second netlist is a netlist with added information about the physical location of the components, Bennett actually teaches away from a "means for generating a second circuit description by removing at least a part of the parasitic information from the first circuit description" as in claim 18.

Sanadidi does not cure Bennett of its deficiencies. Sanadidi does not concern a circuit description that includes "parasitic information" at all, and thus does not teach or suggest a "means for generating a second circuit description by removing at least a part of the parasitic information from the first circuit description" as in claim 18.

Accordingly, because neither Bennett nor Sanadidi (alone or in combination with one another) teaches or suggests all features of amended claim 18, the Examiner's § 103 rejection should be withdrawn and such action is respectfully requested.

Dependent Claims 19-20 Are Also Patentable Over the Cited References

The Examiner also rejects claim 19-20 under 35 U.S.C. § 103 over various combinations of references. Claims 19-20 depend from amended independent claim 18 and are allowable for at least the same reasons recited above with respect to claim 18. Claims 19-20 are also allowable for reciting independently patentable combinations of features.

Accordingly, the Examiner's rejections of claims 19-20 should also be withdrawn and such action is respectfully requested.

The Examiner's § 103 Rejection of Amended Independent Claim 21 Should Be Withdrawn

The Examiner's rejects claim 21 as being obvious under 35 U.S.C. § 103 over *Bennett* in view of *Sanadidi* in further view of *Gullapalli*. The Examiner's rejection is respectfully traversed.

Amended independent claim 21 recites a method of simulating a circuit using an analog or RF simulator, comprising:

> using a computer, generating a system of equations wherein at least one of the equations includes a part that uses a first circuit description comprising parasitic information and a part that uses a second circuit description with parasitic information removed;
> solving the system of equations in order to simulate the circuit; and
> outputting the simulation results.

Bennett does not teach or suggest (nor does the Examiner contend that *Bennett* teaches or suggests) "generating a system of equations wherein at least one of the equations includes a part that uses a first circuit description comprising parasitic information and a part that uses a second circuit description with parasitic information removed."

Sanadidi does not cure *Bennett* of its deficiencies. As explained in the portions of *Sanadidi* cited by the Examiner, *Sanadidi* describes "a first submodel" and "a second submodel". Further: "A performance analysis mechanism 306, having input ports connected to the first 302 and the second 304 submodel, executes a simulation of the particular system component using the first 302 and the second 304 submodel. The performance analysis mechanism 306 includes *a switch 308 for switching between the first 302 and the second 304 submodel* through processor 310 control during the simulation at a predetermined point in the execution of the simulation by the processor 310." (*Sanadidi*, col. 11, lines 18-24) (emphasis added). Thus, in *Sanadidi*, simulation is performed with *either* the "first submodel" *or* the "second submodel", but not both. Thus, *Sanadidi* does not teach a "generating a system of equations wherein at least one of the equations includes a part that uses a first circuit description comprising parasitic information and a part that uses a second circuit description with parasitic information removed" as in amended independent claim 21.

Further, the "switch 308" in *Sanadidi* for switching between the first submodel and the second submodel actually leads away from any combination with *Sanadidi* in which an equation that is solved during simulation includes "a part that uses a first circuit description comprising parasitic information and a part that uses a second circuit description with parasitic information removed". Accordingly, *Sanadidi* teaches away from any combination of the references that would result in the subject matter claimed in amended claim 21. *See* MPEP 2145.X.D.2.

Gullapalli also does not cure *Bennett* of its deficiencies. The cited portions of *Gullapalli* only describe an iterative formula for solving a nonlinear system of equations having the form $F(x)=b$. (*Gullapalli*, paras. 21-22). There is no teaching or suggestion in *Gullapalli* that one of the equations includes "a part formed using [a] first circuit description and a part formed using [a] second circuit description". Therefore, *Gullapalli* also does not teach the recited feature of amended independent claim 21.

Accordingly, because neither *Bennett*, nor *Sanadidi*, nor *Gullapalli* (alone or in combination with one another) teaches or suggests all features of amended claim 21 and because *Sanadidi* actually teaches away from claim 21, the Examiner's § 103 rejection should be withdrawn and such action is respectfully requested.

Dependent claims 22-23 Are Also Patentable Over the Cited References

The Examiner also rejects claim 22-23 under 35 U.S.C. § 103 over various combinations of references. Claims 22-23 depend from amended independent claim 21 and are allowable for at least the same reasons recited above with respect to claim 21. Claims 22-23 are also allowable for reciting independently patentable combinations of features.

Accordingly, the Examiner's rejections of claims 22-23 should also be withdrawn and such action is respectfully requested.

<u>Conclusion</u>

In view of the above amendments and remarks, the Application is believed to be in condition for immediate allowance and such action is respectfully requested. Should any further issues remain concerning this application, the Examiner is invited to call the undersigned attorney at (503) 595-5300.

Respectfully submitted,

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